Prevalence and Associated Factors of Depression in Patients with Multiple Sclerosis

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ABSTRACT: Comorbidity of multiple sclerosis (MS) and depression is documented in several studies. The aim of present study was to evaluate the prevalence of depression among patients with MS and associated factors. This cross sectional study was carried out in Bandar Abbas in 2013. Totally 106 patients were enrolled by convenience sampling and were ask to complete the Persian version of Beck depression inventory (BDI). Each questionnaire pointed between 0 and 63 scores. Patients who achieved less than 8 scores, considered as healthy. Those pointed between 9-18, 19-29, 30-40 and above 40 scores considered as, mildly, moderately, severely and very severely depressed patients respectively. Demographic data of patients and their drugs information collected. Data was analyzed using descriptive statistics indices such as mean, standard deviation, frequency and statistical test including independent sample t-test, chi-square, ANOVA and Pearson's correlation. P-value less than 0.05 considered statistically significant. The mean age of participants was 33.58 ± 8.06 (ranged 18-54 years). Among the participants 31 subjects (29.24%) were healthy and 30 (28.3%), 28 (26.41%), 15 (14.15%), 3 (2.83%) patients were mildly, moderately, severely and very severely depressed respectively. Prevalence of depression among females was two times higher than males (T= -2.16, p-value = 0.033, 95% CI: -9.65_ -0.42). Also, depression was significantly higher among those with lower income and unemployed patients. Prevalence of depression among MS patients in Bandar Abbas was comparable with other studies. Direct interview with an adult psychiatric in order to predict the accurate depression prevalence is recommended.
Key words: Prevalence, Mood Disorders, Depression, Multiple Sclerosis

INTRODUCTION

Multiple sclerosis (MS) is a chronic progressive inflammatory and autoimmune disease with relapsing and remitting episodes (Lerdal et al., 2007). Various debilitating symptoms such as motor dysfunction, blindness, bladder and bowel dysfunction have been reported among the patients with MS (Patten and Metz, 1997). The debilitating symptoms of MS patients are due to demyelination of central nervous system (CNS) in the afflicted patients (Comi et al., 2001). The leading cause of neurologic disorders among young populations with MS is attributed to demyelination process which is seen in MS disease (Dutta et al., 2006).

Many studies have demonstrated that the affected patients suffer from physical and social disabilities and also, psychological disorders including depression, anxiety and lower quality of life (Bol et al., 2010, Feinstein 2011, Patti et al. 2011). The most common psychological disorder, have been seen among MS patients is depression (Feinstein, 2011). The incidence of depression among these subjects estimated to be between 40-60% during their lifetime (Gay et al., 2010, Feinstein, 2011). Many evidences have been reported that depression itself can increase the symptoms of MS and can exacerbate functional impairment (Bol et al., 2010; Tepavcevic et al., 2013). Depression in MS patients also, imposes a substantial economic cost on society (Noyes et al., 2013). Depression can be treated by pharmacological treatments and even cognitive behavioral therapies (Cooper et al., 2011; Koch et al., 2011). The aim of present study was to assess the prevalence of depression in MS patients and associated factors in Bandar Abbas.

MATERIALS AND METHODS

This was a cross sectional study conducted in Bandar Abbas in 2013. The study population was all of the patients with MS who leaved in Bandar Abbas. Totally 106 patients enrolled in the study using conveniences sampling. Inclusion criteria consisting of patients who were diagnosed at least 6 months before the enrollment in the study and the ability to reading and writing. Exclusion

criteria were congenital disease such as Down syndrome and other medical and mental diseases such as hypothyroidism, previous depression and Alzheimer. Patients with severe visual and motor impairments and those who refused to participate in the study were excluded. All of the patients were asked to fill out the reliable and valid Persian version of beck depression inventory (BDI) (Mohammadkhani et al., 2011). BDI is a 21 items questionnaire. Each item is rated from 0 to 3 points and the score for each questionnaire are interpreted by summing the points for all 21 questions (between 0-63).

Patients who scored less than 9 points considered as healthy people and those scored between 9-18 points, 19-29 points, 30-40 points and higher than 40 points considered to have mild, moderate, severe and very severe depression. Demographic data of participants including age, gender, educational level (college and less than college), employment status, marital status (single, married, widow/widower, and separated), family income (low, middle and high), and any psychological disorder were collected.

Also, other information about the MS subtype [relapsing remitting(RR), primary progressive (PP), secondary progressive (SP) and progressive relapsing (PR)], Expanded Disability Status Scale (EDSS) score, frequency and interval of anti-MS medication intake (once a week or three times a week) and corticosteroid consumption were collected.

Data were analyzed using SPSS (V.19). The differences of quantitative variables and quantitative variables among two groups were analyzed by independent sample t-test and chi square respectively. The quantitative variables among more than two groups were analyzed by ANOVA. Association between two quantitative variables was analyzed by Pearson's correlation test. Significant level considered as $P < 0.05$.

RESULTS

Among the 106 patients 37 (34.9%) were male and 69 (65.1%) were female. The mean age of all participants was 33.58 ± 8.06. The mean age of male and female patients was 31.97 ± 8.7 and 34.5 ± 8.06 respectively. This was not statistically significant between both groups ($P > 0.05$).

The most common MS subtype was RR (74.1%), followed by PP, SP (9.25% for each one) and PR which had the lowest prevalence rate (7.4%). Based on the BDI, 31 (29.24%) individuals didn't have depression. While, 75 (70.76%) patients suffered from various degrees of depression. So that, 30 (28.3%) subjects had mild depression, 28 (26.41%) had moderate depression, 15 (14.15%) and 3 (2.83%) had severe and very severe depression.

Table 1. Mean depression scores according to marital status and family income

Variable	Status	Number (Percent)	Mean	SD	P-value
Marital status	Single	29 (27.6%)	13.13	9.26	< 0.001
	Married	60 (57.1%)	16.13	10.96	
	Separated	12 (11.4%)	27.66	9.72	
	Widow or Widower	4 (3.8%)	33.5	15.24	
Family income	Low	41 (38.67%)	21.55	12.35	0.03
	Moderate	57 (53.77%)	16.19	10.73	
	High	8 (7.8%)	8.75	5.28	

The results showed that depression score among patients with lower family income and among widow/widower and separated patients was significantly higher than others subjects. In the following table these differences are demonstrated with details. The mean disease duration was 56.33 ± 37.8 months. Pearson's correlation demonstrated that there was moderated significant association between the duration of disease and depression score (R= 0.5, P < 0.01).The results showed that the mean EDSS score was 2.01 ± 2.12. The results also, showed the mean depression score increased with increasing EDSS score. This association was moderately significant (P < 0.01, R = 0.48). Figure 1 shows this association.

The table above shows, mean depression score among female patients and unemployed patients were significantly higher than male and employed subjects respectively. Also, the mean depression score in university graduated patients was lower than others without academic degrees. But, this difference was not statistically significant (P > 0.05).

The results showed that patients who took higher dose of Anti-MS Medications had higher mean depression score than those who had took lower dose of anti-MS medications.

Also, the results indicated, patients with systemic corticosteroid medication had achieved higher scores for depression. The details about the medication status of patients are listed in Table 3.
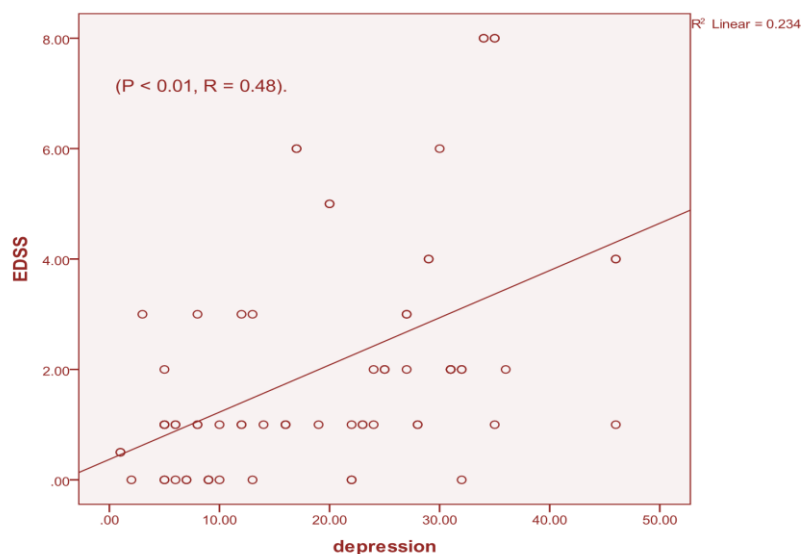

Figure 1. The association between EDSS score and depression score in MS patients

Table 2. The mean depression score according to demographic variables

Demographic variable		Number (Percent)	Mean	SD	95%CI	P-Value
Gender	Male	37 (34.9%)	31.97	8.7	-9.65 , -0.42	0.033
	Female	69 (65.1%)	34.5	8.06		
Employment status	Employed	38 (35.8%)	14.13	10.08	0.27 , 9.46	0.038
	Unemployed	68 (64.2%)	19	12.11		
Educational level	College	33 (31.2%)	14.69	9.83	-1.08 , 8.51	> 0.05
	Less than college	73 (68.8%)	18.41	12.22		

Table 3. The mean depression score based on medication status

Medication variable		Number (Percent)	Mean	SD	95%CI	P-Value
Dosage	Once a week	65 (61.32%)	15.95	12.14	-7.6 , 1.5	> 0.05
	Three times a week	41 (38.68%)	19	10.61		
Corticosteroid medication	Yes	20 (18.9%)	21.2	10.68	-0.8 , 10.5	> 0.05
	No	86 (81.1%)	16.33	11.69		

DISCUSSION

This study was conducted to assess the prevalence of depression in patients with MS who lived in Bandar Abbas, southern Iran. MS is a chronic demyelinating disease with unknown etiology. Although, a number of studies reported that some viral infections such as Epstein–Barr virus and Varicella-Zoster may play a role in

pathogenesis of MS but, it is not well documented (Ahlgren et al., 2009; Dias et al., 2013).

Several psychological impairment have been reported in patients with MS. Evidences have demonstrated that depression in MS patients estimated to be more than two times higher than general population (Ramagopalan et al., 2010; Argyriou et al., 2011). In addition, the majority of authors indicated that depression in female subjects is higher than males (Bobholz and Gremley 2011; Honarmand et al., 2011). The results showed that, depression in female patients was approximately 2 times higher than males. This results was consistent with other studies performed in Japan (Houzen et al., 2003), northern Iran (Kalanie et al., 2003) and Brazil (Arruda et al., 2001) that reported depression was 2.4, 2.5 and 3 times higher in females than males respectively.

The results showed that about 14% of MS patients suffered from severe depression. Mohr et al. (2007) , screened the patients with MS with 2 questions for major depression disorder (MDD) and asked the patients to participate in structured clinical interview. They resulted that about 26% of patients with MS met the criteria for MDD. This result was higher than our study. Mohr determined the prevalence of depression by assessing anhedonia and depressed mood. While, in BDI, which was used in the present study, anhedonia and depressed mood are not diagnostic for depression alone. The difference between the present study and Mohr could be due to different study tools were used. Williams and colleagues reported depression rate among the veterans with MS was 22% (Williams et al., 2005).

This also, could be due to the differences of population studied. Our results demonstrated that the most prevalent MS subtype was RR subtype. And the least frequent was PR subtype. This results was consisted with many studies (Lublin and Reingold 1996; Wood et al., 2013)

In this study, there was significant direct association between EDSS score and depression. Also, significant association was seen between disease duration and mean depression score. Many authors have indicated this association (Krupp et al., 1988; Williams et al., 2005). The explanation for these associations is that the majority of patients with RR subtype, finally enters a SP phase and experience more and severe clinical symptoms than RR subtype. Which is associated with higher depression rate (Krupp et al., 1988; Lublin and Reingold, 1996)?

This study demonstrated that depression in patients with MS was statistically higher in widow/widower and separated patients than other subjects. A finding was consistent with the result reported by Williams et al.(Williams et al., 2005). This could be due to lack of psychological and financial support in these groups (Hakim et al., 2000).

The results showed that patients with lower family income and those received higher dose of Anti-MS Medications achieved higher depression score. The effect of economic level on depression is documented in various investigations (Hakim et al., 2000; Williams et al., 2005). On the other hand, the higher depression score in high dose medication groups can be attributed to several factors. The first and most important subject is this group is that the patients with more severe clinical symptoms need to take higher dose of Anti-MS Medications. The second factor could be the cost of treatment in this population. Another reason may be the psychological burden of consuming drugs with shorter intervals.

Also, the results showed that employed patients had achieved lower depression score than unemployed patients. The same finding reported in other studies (Rao et al., 1991; Amato et al., 2001).

This study was limited by various conditions. The patients were assessed by questionnaire and structured clinical interview didn't conduct for accurate diagnosis of depression. Also, in this study some patients refused to participate in the study. In addition, patients with severe disabilities didn't enrolled. All of these limitations can affect the study results.

In this study we concluded that, depression in patients with MS can be attributed to several factors such as gender, educational level, economic status, marital status, employment status, disease duration, EDSS score and high dose of Anti-MS Medications. Further studies with considering structured clinical interview, and higher sample size are recommended to estimate the accurate depression rate among the patients with MS.

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